

Abstract

A solar still apparatus is described for the multi-effect distillation of a fluid such as water. A transparent condenser air duct overlies an evaporator air duct having a light-absorbing floor, both sharing a transparent plastic film wall. Air, blown by a fan, flows through the lower duct, where it progressively warms and evaporates a feedstock fluid. At the hot end of the lower duct, the air enters the upper duct where it flows in a reverse direction, progressively cooling and condensing its vapor, a portion of the heat of condensation being transferred through the shared wall to the lower duct. Thermal gradients established within the still facilitate the evaporation and condensation of the fluid with minimal heat loss to the environment and maximal recuperation of the heat of condensation for fluid evaporation. A working fluid may be used to extract useful power from the still's thermal gradients.